2018 Comprehensive Summary Report

Spring Lake

Green Lake County (WBIC 148100)

Introduction and Survey Objectives

In 2018, the Department of Natural Resources conducted a fyke netting and late spring electrofishing survey of Spring Lake in order to provide insight and direction for the future fisheries management of the water body. Primary sampling objectives of this survey were to characterize species composition, relative abundance and size structure. The following report is a brief summary of the activities conducted, general status of fish populations and future management options.

Acres: 75 Shoreline Miles: 1.5 Maximum Depth (feet): 42
Lake Type: Drainage Public Access: One Public Boat Launch
Regulations: All species statewide default regulation.

Survey Information						
Site location	Survey Dates	Water Temperature (°F)	Target Species	Gear	Number of Nets	Net Nights
Spring Lake	3/31/2018 - 4/08/2018	37 - 40	Northern Pike, Panfish	Fyke Net	4	32

WISCONSIN DNR CONTACT INFO.

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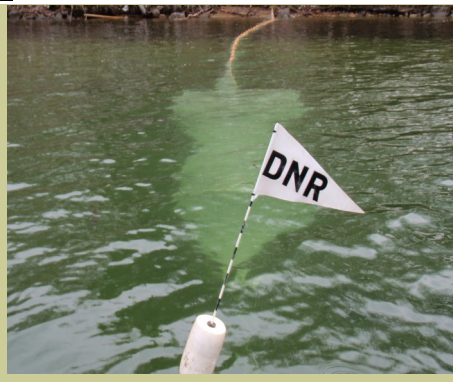
Survey Method

- Spring Lake was sampled according to spring netting (SNI) protocols as outlined in the statewide lake assessment protocol. The primary objective for this sampling period is to count and measure adult walleye and northern pike. Other gamefish/panfish may be sampled but are considered by-catch as part of this survey.
- Fyke Nets were deployed in areas of the lake that contained spawning habitat or were likely travel areas for northern pike and walleye. All newly captured northern pike and walleye were given a partial fin clip (top caudal fin). Some northern pike were weighed and age structures (i.e., anal fin rays) were collected. A subsample of bluegill, black crappie and yellow perch were also taken for age and growth analysis.
- Fish metrics used to describe fish populations include catch per unit effort, total abundance, proportional stock density, length frequency distribution, mean age at length, and relative weight.



Fish Metric Descriptions

Catch per unit effort (CPUE) is an index used to measure fish population relative abundance, which simply refers to the number of fish captured per unit of distance or time. For netting surveys, we typically quantify CPUE by the number and size of fish per net night. CPUE indexes are compared to statewide data by percentiles and within lake trends. For example, if a CPUE is in the 90th percentile, it is higher than 90% of the other CPUEs in the state.

Total abundance is a metric that describes population size and is estimated by mark and recapture. In our study, all northern pike that were captured were given a partial caudal fin (i.e., tail fin) clip and released. Each time the nets were checked, all northern pike were examined for a partial caudal fin clip. The number of previously captured individuals (i.e., fin clipped) was recorded and proportions of marked individuals to unmarked individuals was used to estimate the total abundance of the northern pike population.

Proportional Stock Density (PSD) is an index used to describe size structure of fish populations. It is calculated by dividing the number of quality size fish by the number of stock size fish for a given species. PSD values between 40 - 60 generally describe a balanced fish population.

Length frequency distribution (LFD) is a graphical representation of the number or percentage of fish captured by half inch or one inch size intervals. Smaller fish (or younger age classes) may not always be represented in the length frequency due to different habitat usage or sampling gear limitations.

Mean Age at Length is an index used to assess fish growth. Calcified structures (e.g., otoliths, spines, or scales) are collected from a specified length bin of interest (e.g., 7.0-7.5 inches for bluegill). Mean age is compared to statewide data by percentile with growth characterized by the following benchmarks: slow (<33rd percentile); moderate (33rd to 66th percentile); and fast (>66th percentile).

Relative Weight is an index used to assess the plumpness (i.e., condition) of fish. It is calculated by comparing the observed weight of a fish to the standard weight (i.e., predicted average weight) of that fish given its length. A relative weight of 93 means it has average plumpness/weight compared to other fish of the same length. Relative weights above 93 mean it is more plump than average.

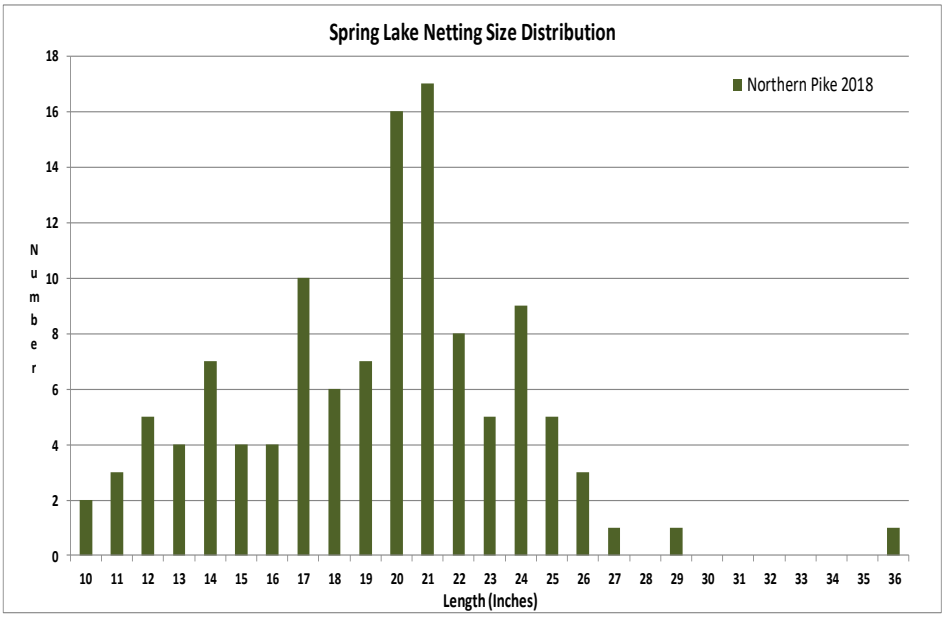
Relative Abundance (Catch per Unit Effort)							
Species	2018 Total Number Captured	CPUE # per net night 2018	SN1 2018 Statewide Percentile Rank	SN1 2018 Abundance Rating	SEII CPUE Total # per mile	SEII Per-centile Rank # per mile	SEII Overall Rating
BLACK CRAPPIE	233	7.3	68th	Moderate	10	62nd	Moderate
BLUEGILL	141	4.4	34th	Moderately-Low	69	44th	Moderate
BOWFIN	2	0.06	-	-	0.56	-	-
COMMON CARP	13	0.41	-	-	6.1	-	-
GREEN SUNFISH	3	0.09	-	-	0.56	-	-
LARGEMOUTH BASS	10	0.3	45th	Moderate	25	68th	Moderate
NORTHERN PIKE	177	5.5	85th	Moderately High	1.1	37th	Low – Moderate
PUMPKIN-SEED	2	0.06	38th	Moderately-Low	1.1	12th	Low
ROCK BASS	20	0.63	-	-	5.0	-	-
YELLOW BULLHEAD	44	1.4	-	-	2.2	-	-
YELLOW PERCH	30	0.9	39th	Moderately-Low	11	56th	Moderate

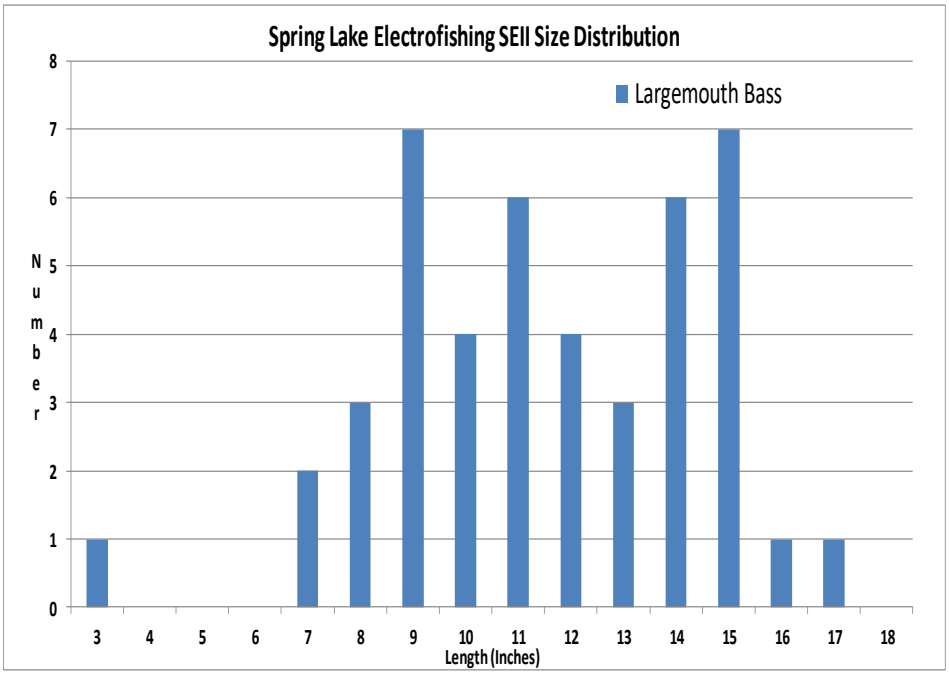
2018 Size Structure Metrics

Species	Total	Average Length (inches)	Length Range (inches)	Stock and Quality Size (inches)	Stock Number	Quality Number	PSD	Percentile Rank	Size Rating
NORTHERN PIKE	118	19.8	10.0 - 36.0	14.0 and 21.0	104	50	48	62nd	Moderate
LARGEMOUTH BASS Netting SN1	10	13.2	8.0 - 17.5	8.0 and 12.0	10	6	60	36th	Low – Moderate
LARGEMOUTH BASS Electrofishing SEII	45	12.0	3.4 - 17.3	8.0 and 12.0	42	22	52	47th	Moderate

2018 Total Adult Abundance (Mark and Recapture Population Estimate)

Species	Number Marked (Netting)	Number Sampling Events (Netting)	Number Recaptures (Netting)	Schumacher-Eschmeyer Population Estimate (95% C.I.)	Number per Acre	Abundance Rating
NORTHERN PIKE	116	6	55	177 (155 - 204)	2.4	Moderate





Gamefish Summary

Northern Pike

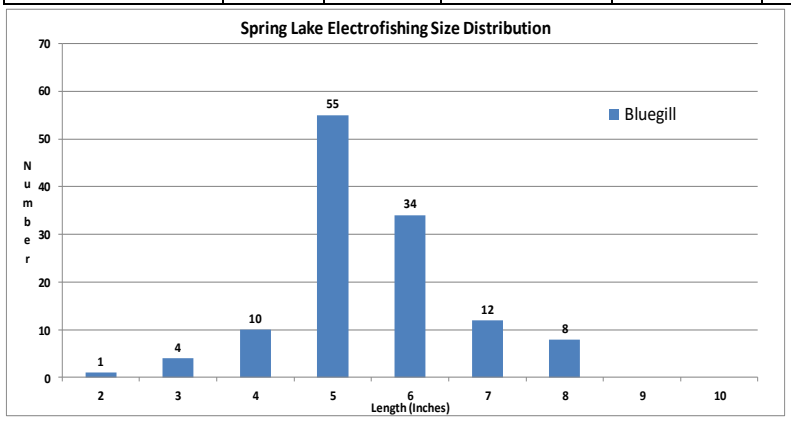
- Density of northern pike were found at moderately high levels when compared to statewide data for catch per net night and the 2.4 fish per acre population estimate shows there is a moderate population.
- Size structure was moderate with 48% of fish larger than quality size of 21 inches. Six fish were sampled larger than the size limit of 26 inches, RSD26=6%. Spring Lake has the potential to grow memorable sized fish based off the sampling of a fish larger than 36 inches.
- Good habitat exists in Spring Lake for northern to spawn. More than 2/3 of the shoreline is rimmed with emergent vegetation.

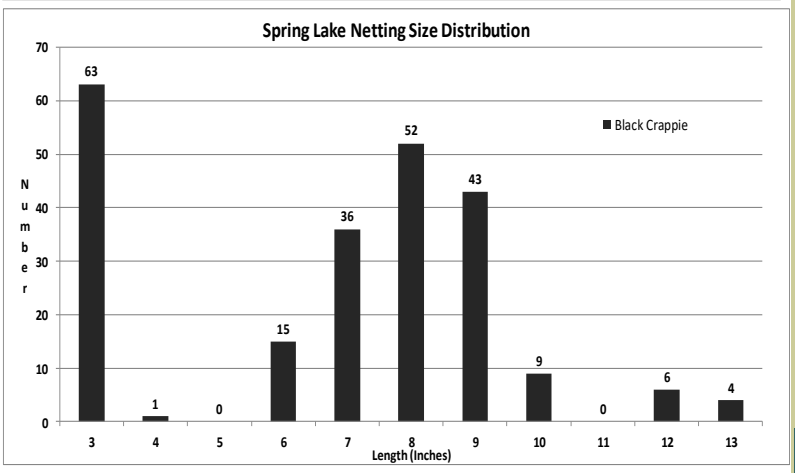
Largemouth Bass

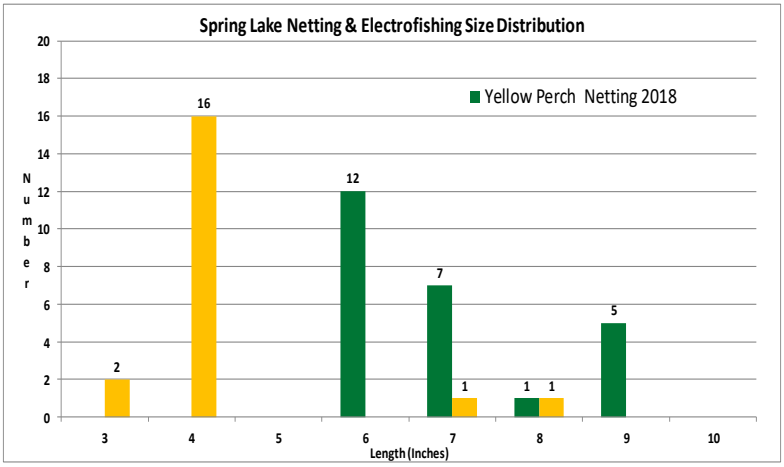
- Largemouth bass abundance was moderate in both surveys with 25 total per mile of shoreline or 53 per hour ≥ 8 inches. This puts it in the 68th percentile and the lower end of the 50-150 fish per hour ≥ 8 inches we like to see on our area waters.
- Size structure was low to moderate in the netting survey but was moderate in the electrofishing survey, which is the preferred gear to use for evaluating a largemouth bass population. (Netting data is rarely used.) The electrofishing survey showed the PSD=52% which ranks in the 47th percentile. The RSD14 which is the number of fish 14 inches or larger that are also larger than stock size = 8 inches was 36%.

2018 Size Structure Metrics

Species	2018 # Caught	Number Measured	Average Length (inches)	Length Range (inches)	Stock and Quality Sizes (inches)	Stock Number	Quality Number	PSD	Percentile Rank	Size Rating
BLUEGILL Netting SN1	141	0	-	-	3.0 and 6.0 inches	-	-	-	-	-
BLUEGILL Electrofishing SEII	124	124	6.0	2.0 - 8.5	3.0 and 6.0 inches	123	54	44%	70th	Moderate - High
BLACK CRAPPIE Netting SN1	233	229	7.3	3.0 - 13.5	5.0 and 8.0 inches	165	114	69%	59th	Moderate
BLACK CRAPPIE Electrofishing SEII	18	18	8.9	3.0 - 12.5	5.0 and 8.0 inches	14	12	86%	86th	High
YELLOW PERCH Netting SN1	30	25	7.3	6.0 - 9.0	5.0 and 8.0 inches	25	6	24%	62nd	Moderate
YELLOW PERCH Electrofishing SEII	20	20	4.8	3.5 –8.5	5.0 and 8.0 inches	2	1	50%	Too Few	-







Panfish Summary

Bluegill

- Bluegill densities were found to be moderately low in the netting survey and moderate in the electrofishing survey. With a total catch rate of 69 /mile of shoreline and 145/hour of fish ≥ 3 inches, the population is on the low end of what we would like to see.
- The ratio of 1:3, (bass: bluegill) is good and represents a balanced fishery.
- Size structure was moderately-high based off percentiles (70th) statewide with a PSD=44%. The RSD7=16%

Black Crappie

- Black crappie densities were moderate in both surveys, falling in the 68th percentile for netting and the 62nd percentile for electrofishing.
- Black crappie size structure was moderate (PSD=69) in the netting survey and high (PSD=86) in the electrofishing survey. RSD10 was 12% in netting and 57% in electrofishing surveys.

Yellow Perch

- Yellow perch densities were found to be low-moderate in our netting survey, 39th percentile and moderate in our electrofishing survey falling into the 56th percentile.
- Yellow perch size structure was moderate in our netting survey with a PSD= 24%. Size structure was low in our electrofishing survey with only 2 fish out of 20 larger than the stock size of 5 inches and 1 larger than quality size of 8 inches.

Stocking History 1972 - Present

Species	Year	Age	Source	Mean Length (inches)	Number Stocked
RAINBOW TROUT	1981	YEARLING	DNR	-	1,000
BROWN TROUT	1984	YEARLING	DNR	7.0	2,000
LARGEMOUTH BASS	1985	FINGERLING	PRIVATE	3.0	7,500
NORTHERN PIKE	1994	FINGERLING	DNR	7.7	150
NORTHERN PIKE	1995	FINGERLING	DNR	8.2	150
LARGEMOUTH BASS	1996	FINGERLING	DNR	1.4	3,350
NORTHERN PIKE	1996	FINGERLING	DNR	8.0	300
NORTHERN PIKE	1997	LARGE FINGERLING	DNR	8.0	150

Observations and Management Options

Northern Pike

Northern pike were found at moderate-high densities and have potential to grow to at least 36 inches. Like many of our waters harvest may be limiting the number of pike ≥ 26 inches on Spring Lake. With at least 2/3s of the shoreline rimmed with emergent vegetation and a 42 foot depth, Spring Lake has good spawning habitat and coolwater refuge for northern pike to sustain a quality fishery. One concern might be the moderate forage base. Northern pike were stocked in the past, but this survey shows there is no need for any stocking of northern pike. The population of 2.4/acre is a healthy number to maintain. It would be preferable to see the number of fish greater or equal to the 26 inch size be between 30-40% instead of the 6% that exist now. Alternative size limits could be considered to help increase the number of fish ≥ 26".

Largemouth Bass

Maintain or increase largemouth bass densities and maintain size structure. Largemouth bass density is at the low end (53 per hour ≥ 8 inches) of what we typically like to see (50-150 per hr ≥ 8 inches), but with panfish densities only at moderate levels, this might be a good density. With the PSD = 52% and RSD14 = 36% this appears to be a reasonably balanced, healthy bass fishery.

Bluegills

Bluegills were found to be at moderate levels in the electrofishing survey at 69/mile total and 145/hour ≥ 3 inches. We would prefer to see these numbers increased to a total of 150+ per mile and between 200-300/hour ≥ 3 inches. Size structure was relatively good (PSD6=44) and we would like to maintain the PSD between 40-60.

Black Crappie

It would be good to see black crappie densities and size structure maintained or slightly increased from current levels. Fish appeared to be in great condition and the abundance of nearshore emergent vegetation should provide good spawning habitat. Black crappie tend to pull off sporadic year classes and the excellent habitat should help keep this population healthy.

Yellow Perch

Yellow perch abundance and size structure was low - moderate in our surveys. Shoreline habitat seems to be adequate to produce some nice year classes of yellow perch.

Experimental panfish regulations are being evaluated statewide and depending on results, Spring Lake may be a candidate down the road for one of these regulations to help bolster it's panfish population.

Carp

There appears to be a fairly decent size population of carp in Spring Lake. The night of our electrofishing run they could be heard spawning in the west end of the lake, deep in the emergent vegetation. There is likely a resident population, since we caught them in our fyke nets immediately after ice had gone out. There could also be fish that migrate up Spring Creek from the Green Lake County K estuary. There are on going efforts to reduce the population of carp in this estuary. The population in Spring Lake appears to be made up of mostly adults and thankfully we did not see any immature fish. If carp become an extreme problem down the road, management options such as an exclusion weir on the mouth of Spring Creek and rotenone treatment could be considered.